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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/196,064	11/19/1998	HARM J. W. BELT	PHN16.638	8724

24737 7590 07/15/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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BRIARCLIFF MANOR, NY 10510

EXAMINER

LAO, LUN S

ART UNIT	PAPER NUMBER
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2643

DATE MAILED: 07/15/2004

29

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/196,064

Applicant(s)

BELT ET AL.

Examiner

Lun-See Lao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Introduction

1. This communication is responsive to the applicant's amendment filed 04-28-2004. Claims 1, 8 and 9-10 have been amended and claim 11 has been added. Claims 1-11 are pending.

Claim Objections

2. Claim 10 is objected to because of the following informalities: claim 10 recites "the combined audio signal" on line 8, which appears to be --- a combined audio signal--
-. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 5, 7-10, are rejected under 35 U.S.C. 102(e) as being anticipated by Furuya (US PAT. 5,774,562).

Consider claim 1, Furuya teaches an audio arrangement for that utilizes an energy transfer function for delay compensation, said arrangement comprising:

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a plurality (see fig.3, (C1 and C2)) of audio sources generating a plurality of input audio signals;

a processor (4) comprising a scaling means (11_1 and 11_2) for weighting the plurality of input signals and deriving a plurality of a processed audio signals from the plurality of input audio signals without delay values (see col.4 lines 13-56); and

a combiner (see fig.3, (12)) that derives a combined audio signal from the plurality of processed audio signals;

controller (5) that causes the processor to maximize (by error signals become equal to 0 and then the signal becomes maximizing and see col.4 lines 57-67) a power measure of the combined audio signal, wherein the controller (5) is arranged to limit a combined power gain measure of the processed audio signals to a predetermined value without measuring an energy transfer at each site where one respective audio source of the plurality of audio sources receives the input audio signals (see col.4 line 13-col.6 line 28).

Consider claim 2, Fururya discloses that audio processing arrangement wherein the processor includes a scaling means (see fig.3, (11_1 and 11_2)) for scaling the input audio signals with a scaling factor (coefficient) for obtaining the processed audio signal (4), said controller (5) includes a further scaling means (see fig.3, (11_1 and 11_2)) for deriving a plurality of scaled combined audio signals (12) with a scaling factor (coefficient) corresponding to the scaling factor of the scaling means(see fig.3, (11_1 and 11_2)), and in that the controller (5) is arranged for maximizing (by error signals become equal to 0 and then the signal becomes maximizing and see col.4 lines 57-67)

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power measure of the combined (12) audio signal, and for limiting a combined (12) power gain measure of the processed audio signals by minimizing a difference between the input audio signals and the scaled combined audio signals corresponding to said audio signals (see col.4 line 13-col.6 line 28).

Consider claim 3, Furuya teaches that the audio processing arrangement wherein the processor (see fig.3, 4) includes a plurality of adjustable filters (see fig.3, (11₁ and 11₂)) for deriving the processed audio signal, in that the controller (5) includes a plurality of further adjustable filters (see fig.3, (11₁ and 11₂)) having a transfer function being the conjugate of the transfer function of the adjustable filters (see col.5 line 1-col.6 line 28), said further adjustable filters (see fig.3, (11₁ and 11₂)) being arranged for deriving from the combined (12) audio signal filtered combined audio signals, and in that the controller is arranged for maximizing (by error signals become equal to 0 and then the signal becomes maximizing and see col.4 lines 57-67) the power measure of the combined audio signal, and for restricting a combined power gain measure of the processed audio signals to a predetermined value by controlling the transfer functions of the adjustable filters(see fig.3, (11₁ and 11₂)) and the further adjustable filters(see fig.3, (11₁ and 11₂)) in order to minimize a difference measure between the input audio signals and the filtered combined audio signal corresponding to say input audio signals (see col.4 line 12-col.6 line 28).

Consider claims 5 and 7 Furuya teaches the audio processing arrangement of the audio sources comprise a plurality of microphones (see fig.3, (C1 and C2)), and in that the microphones are placed in a position such that their directionality patterns are

substantially disjunct (C1 and C2); and the audio processing arrangement of the audio sources comprise a plurality of microphones being placed in a linear array (see fig.3 (C1 and C2) and col.5 lines 1-15).

Consider claim 8 Furuya teaches an audio signal processing arrangement that utilizes an energy transfer function for delay compensation, said arrangement comprising a plurality of inputs (see fig.3, (C1 and C2))) for receiving input audio signals, processing means (see fig.3, (4)) for deriving processed audio signals including scaling means (see fig.3, (11₁ and 11₂)) for scaling the input audio signal without delay values, the audio processing arrangement comprising combining means (9) for deriving a combined audio signal from the processed audio signals (4), the audio processing arrangement comprises a control means (5) for controlling the processing means (11) in order to maximize (by error signals become equal to 0 and then the signal becomes maximizing and see col.4 lines 57-67) a power measure of the combined audio signal, and in that the control means are arranged for limiting a combined power gain measure of the processed audio signals to a predetermined value without measuring an energy transfer at each site where each respective one the plurality of audio sources receives the input audio signals (see fig.3 and col.4 line 13- col.6 line 28).

Consider claim 10, there is a method claim corresponding to apparatus claim 8. See previous apparatus claim 8 rejection.

Consider claim 9, Furuya discloses that the audio signal processing arrangement the scaling means (see fig.3, (11₁ and 11₂)) scale the input audio signals with a

scaling factor (coefficient) for obtaining the processed audio signals, said control means (5) comprise further scaling means (see fig.3, (11₁ and 11₂)) for deriving a plurality of scaled combined audio signals (12) with a scaling factor (coefficients) corresponding to the scaling factor of the scaling means (see fig.3, (11₁ and 11₂)), and in that the control means (5) are arranged for maximizing (by error signals become equal to 0 and then the signal becomes maximizing and see col.4 lines 57-67) a power measure of the combined audio signal, and for limiting a combined (12) power gain measure of the processed audio signals by minimizing a difference between the input audio signals and the scaled combined audio signals (see fig.3 and col. 4 line 13-col.6 line 28).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Furuya (US PAT. 5,774,562) in view of Kellermann (US PAT 5,602,962).

Consider claim 4 Furuya does not clearly teach the audio processing arrangement comprises delay elements for compensating a delay difference of a common audio signal present in the input audio signals.

However, Kellermann teaches the audio processing arrangement comprises delay elements (see fig.1, #2) for compensating a delay difference of a common audio signal present in the input audio signals (see col.3 line 18-60).

Therefore, it would obvious to one of ordinary skill in the art at the time invention was made to combine the teaching of Furuya into Kellermann to provide an improved reduction of noise components of the microphone signals is achieved and the audibility of speech is further improved.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya (US PAT. 5,774,562) in view of Kaneda (US PAT 4,536,887).

Consider claim 6, Furuya does not teach clearly the audio processing arrangement of the microphones are placed around a center position at angles being equal to 360 degrees divided by the number of microphones.

However, Kaneda discloses that the audio processing arrangement includes that the microphones are placed around a center position at angles being equal to 360 degrees divided by the number of microphones (see fig.21d and col.20 line 10-col.21 line 20).

Therefore, it would obvious to one of ordinary skill in the art at the time invention was made to combine the teaching of Furuya into teaching of Kaneda to provide microphone-array apparatus which can be constructed on a small scale and permits adaptive selection of the desired signal for varied positions of a desired signal and noise sources.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Furuya (US PAT. 5,774,562) in view of Anderson (US PAT 6,137,887).

Consider claim 11, Furuya teaches the audio processing arrangement of further comprising a plurality of microphones having disjunct directionality patterns, wherein the audio signals are obtained from said plurality of microphones (see fig.3 (C1 and C2)), but Furuya fails to teach the microphone receiving a strongest speech signal is automatically emphasized.

However, Anderson teaches the microphone receiving a strongest speech signal is automatically emphasized ((greater than 9.5 db), see fig.3c and col.9 lines 5-53).

Therefore, it would obvious to one of ordinary skill in the art at the time invention was made to combine the teaching of Furuya into teaching of Anderson to provide an improved multiple-microphone audio system that identifies which microphone of a plurality of microphones best detects an audio source.

Response to Arguments

9. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Iwahara (US PAT 4,696,043) and Janse (US PAT. 5,610,991)

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are recited to show how other related the audio processing arrangement with multiple sources.

11. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (703) 305-2259. The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao,Lun-See
Patent Examiner
US Patent and Trademark Office
Crystal Park 2
(703305-2259)


CURTIS KUNTZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600